Navigating Socio-Environmental Shocks:
An Examination of Coastal Tourism in Indonesia Amidst COVID-19

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Abstract

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Coastal tourism is being developed as an alternative or supplement to capture fisheries with the hopes that it would be able to bring economic growth, while also reducing environmental impacts, and improving social well-being. Despite the wealth of existing literature, there is still a lack of clear assessment on whether tourism proves to be the better path forward for coastal communities. This research used a mixed methods approach that included field observations and semi-structured interviews in 5 rural coastal communities in Indonesia that are in the process of transitioning from capture fisheries to tourism to understand the impacts of the transition on i) the local communities, ii) the environment, and iii) the communities' capacity to cope with shocks, utilizing the corona virus disease of 2019 (COVID-2019) pandemic to conduct a case study of how the industries cope with shock. Overall, the findings from this research shed light on the complex and dynamic relationship between coastal tourism and capture fisheries,

demonstrating potential benefits and challenges related to the coexistence of both industries. The study of the COVID-19 pandemic highlighted how the presence of the two can allow communities to better respond to changes, suggesting the importance of considering interconnections of productive activities when planning coastal development strategies worldwide.

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Chapter 1. INTRODUCTION

The past few decades have witnessed a significant growth in global tourism. Total international tourist arrivals have jumped from 25.20 million in 1950 to 1.40 billion in 2018, a more than 50-fold increase (Roser & Herre, 2017). This is partly driven by the use of tourism as a tool to bring development and alleviate poverty for many communities around the world (Chok et al., 2007; Scheyvens, 2007). More recently, tourism is also viewed to be able to promote environmental sustainability. As one of the pillars of Blue Economy, tourism is believed to provide "financial incentives and mechanisms" for the protection of ocean ecosystems (UN World Tourism Organization, 2022). Community-based ecotourism (CBET), which Mtapuri and Giampiccoli (2019) define as a type of tourism "that encompasses environmental and cultural/social sustainability, local involvement/benefits, and social equity/redistributive justice and control of the tourism sector" (p. 22), is sometimes placed at the center of these discussions. In coastal areas, CBET is often proposed as an alternative or supplement to fisheries (e.g., Cheong, 2005; Porter et al., 2015).

Although ideally tourism could simultaneously address the world's economic, social, and environmental problems, in reality, there is a lack of evidence of this (Chok et al., 2007) and shocks such as changing markets and environmental conditions could jeopardize tourism's potential benefits. For instance, although the coronavirus disease of 2019 (COVID-19) pandemic was primarily a health crisis, it also created a shock to the global economy (Roubini, 2020) and heavily impacted the tourism industry. Tourism's contribution to global gross domestic product (GDP) plummeted by 50.4% from US$ 9,630 billion in 2019 to US$ 4,775 billion in 2020 (World Travel & Tourism Council, 2022). Community-based tourism (CBT) was not exempt, and a number of

studies have uncovered the ways they are negatively impacted by the pandemic (e.g., Kungwansupaphan, 2021; Noorashid & Chin, 2021). Thus, whether tourism development is the right path forward to bring economic growth, social well-being, and environmental sustainability is questionable in a rapidly changing world.

To address this knowledge gap, this research used a mixed methods approach that included field observations and semi-structured interviews in 5 rural coastal communities in Indonesia that are in the process of transitioning from capture fisheries to tourism to understand the impacts of the transition on i) the local communities, ii) the environment, and iii) the communities' capacity to cope with shocks. This was achieved by using the Blue Transition concept, which Nalhuelhual et al. (2019) defines as "the passage from fish biomass reduction to recovery in exploited aquatic resources, enabled by aquaculture" (p. 584), as a framework to systematically study the transition in the communities. The use of this concept also allowed for the assessment of the transition from an ecological perspective by looking at the impact of the transition to wild fish biomass. The study of the communities' capacity to cope with shocks was done by conducting a case study on how the communities coped with the COVID-19 pandemic.

Overall, the findings from this research shed light on the complex and dynamic relationship between coastal tourism and capture fisheries, demonstrating potential benefits and challenges related to the coexistence of both industries. The study of the COVID-19 pandemic highlighted how the presence of the two can allow communities to better respond to changes, suggesting the importance of considering interconnections of productive activities when planning coastal development strategies worldwide. Decision makers should be particularly aware of the unexpected negative consequences of shocks, such as the emergence of damaging fishing practices

observed in this study. The findings were then used to formulate two recommendations on how to further support tourism development in the five villages.

Chapter 2. METHODOLOGY

2.1 STUDY SITES

Data collection for this research was conducted in Teluk Alulu, Teluk Harapan, Payung-Payung, Bohe Silian, and Teluk Semanting Villages in Berau Regency (Fig 2.1). Teluk Alulu, Teluk Harapan, Payung-Payung, and Bohe Silian are located on Maratua Island, an atoll northeast of Kalimantan Island. Teluk Semanting, on the other hand, is located on the Berau River delta on mainland Kalimantan Island. Tourism currently has the third largest contribution to Berau Regency's revenues after mining and palm oil (Kaltim Post, 2022). In 2020, the tourism sector contributed Rp. 23 billion or 9.84% of the regency's total revenue and provided 2,613 jobs (Ghofar, 2021). In 2019, a total of 301,015 domestic and international tourists visited the regency, though this number dropped to 127,396 in 2020 due to the COVID-19 (Statistics Indonesia of Berau, 2022). The five villages were selected as study sites due to their marine tourism potential as well as their status as either current or potential sites for the environmental non-governmental organization (NGO), YKAN's (*Yayasan Konservasi Alam Nusantara*) conservation programs.

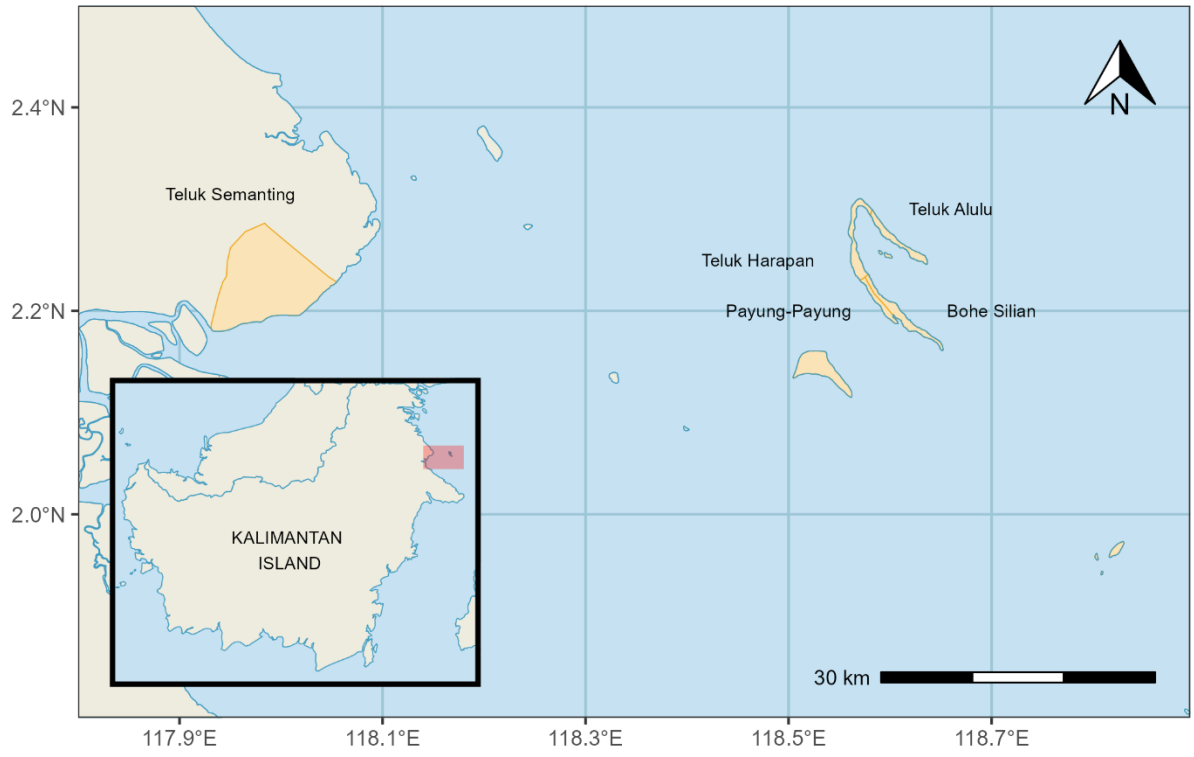

Figure 2.1. Map of the study sites (spatial data from Hijmans, 2022 and Natural Earth).

2.2 DATA COLLECTION

Fieldwork for this research was conducted between August and October of 2022 and was divided into two fieldwork efforts. The first effort was performed to observe the study sites to better understand the extent of tourism development in each site and to help preparations for the second fieldwork effort. This information was gathered through field observations, a review of government documents, as well as informal interviews with villagers, local government officials, and YKAN staff. The second fieldwork effort was dedicated to conducting interviews.

The interviews were conducted in a semi-structured manner and were used to investigate i) respondents' level of participation in fisheries and tourism activities; ii) whether they felt like they have transitioned from capture fisheries to tourism; and iii) their views on tourism development in

their villages (see Appendix A). All interviews were conducted by the author who is an Indonesian national in Indonesian language, although throughout the data collection, the author was assisted by at least one YKAN field staff in each study site. To create a more natural and comfortable ambience for the respondents, the interview responses were recorded through handwritten notes instead of an audio or video recording device. After data collection, all the notes were transcribed for data analysis.

Respondents for this research must meet the following criteria: i) residents of the study site; ii) aged 21 years or above; and iii) have experience in fisheries and/or tourism. Sample selection was done using a snowball sampling method (Berndt, 2020). The first few respondents were selected based on recommendations from YKAN field staff, village officials, and other residents. At the end of each interview, the author asked respondents if they had recommendations of other residents to be interviewed. In total, the author interviewed 55 respondents from the five villages, 10 respondents each from Teluk Alulu and Payung-Payung, 11 respondents from Teluk Harapan, and 12 respondents each from Bohe Silian and Teluk Semanting.

2.3 DATA ANALYSIS

This research combines both quantitative and qualitative data analysis methods. Quantitative data analysis for this research was conducted using R version 4.2.2 (2022-10.31 ucrt) and RStudio 2022.12.0+353 (Posit Team, 2022; R Core Team, 2022). Qualitative data analysis was conducted using the software ATLAS.ti Windows version 9.1.7.0 (ATLAS.ti Scientific Software Development GmbH, 2020).

2.4 TOURISM DEVELOPMENT

Tourism development in the study sites were characterized based on marine tourism potential, site accessibility, infrastructure, as well as category of tourism development according to standards from the Ministry of Tourism and Creative Economy of the Republic of Indonesia (MTCE) and the Ministry of Marine Affairs and Fisheries of the Republic of Indonesia (MMAF). To better understand the extent of tourism development at the individual level, it was necessary to categorize each respondent's level of transition. This was done by using the following metrics: i) the industry that respondents were involved in (tourism-only, fisheries-only, or both), ii) main source of income (tourism, fisheries, or other), and iii) their own positioning between the two industries. To determine respondents' involvement in the two industries, they were asked to mention all the tourism-related and fisheries-related activities that they have participated in in their lifetimes. Respondents that were involved in fisheries have taken part in at least one of the fisheries activities, while those involved in tourism have participated in at least one of the tourism activities. With regards to respondents' positioning between the industries, respondents were asked if they felt like they had transitioned to tourism. One thing to note was that during data collection, when the question was asked in Indonesian, the term used was closer to "switching to tourism" than "transitioning to tourism".

2.5 IMPACTS ON THE ENVIRONMENT

Analysis of the impacts of the transition to the environment was done by asking respondents to indicate which activity they viewed as more harmful to the environment and comparing current fishing effort among respondents. The Blue Transition concept proposes that the exploitation of wild fish biomass should decrease as capture fisheries is surpassed by the aquaculture. In this

research, the change in fishing effort was used as a proxy for the level of pressure on marine resources. Fishing effort for each respondent was assigned based on the fishing gears used and the amount of time spent on fishing in a week. For this calculation, each gear was assigned a score between 1-5 according to their selectivity, i.e. the gear's ability to only capture the intended fish species and size (PT. Bina Marina Nusantara, 2006). This score was assigned based on a review of existing literature on the selectivity of fishing gears used in Indonesia and by giving a higher score to less selective fishing gear (Chaliluddin et al., 2019; Firdaus et al., 2017; Nurdin & Hufiadi, 2006; Nurhakim et al., 2009; Pramesthy & Mardiah, 2019; PT. Bina Marina Nusantara, 2006; Silaban et al., 2017; Tupamahu et al., 2021; Wuaten et al., 2022) (Table 2.1).

Table 2.1. Gear selectivity

Fishing gear	Score
Octopus hook, speargun, arrow, spear, slingshot	1
Handline	2
Longline, crab trap, lift net, net (unspecified)	3
Seine, gillnet, kelong	4
Trawl	5

To calculate the fishing time, respondents were asked to state the number of hours per day and number of days per week dedicated to fishing. The scoring was done by assigning a higher score for more time spent on fishing (Table 2.2). The fishing time was calculated by multiplying the score of days times the score of hours. The use of scores for fishing time instead of the actual number of days and hours was appropriate given that this research only compares among fishers within the same study area.

Table 2.2. Fishing time

Fishing time	Score
Number of days/week	
1-4	1
5-7	2
No pattern	2
Multiple-days trips	3

Number of hours/day	
<8	1
8	2
No pattern	2
>8	3

Median gear and time scores were used for respondents who used multiple fishing gear or did not have a regular fishing habit. The fishing effort for each respondent was then calculated by the following formula:

$$\textit{Fishing effort} = \textit{gear selectivity} \times \textit{fishing time} \tag{2.1}$$

Chapter 3. RESULTS

3.1 TOURISM DEVELOPMENT

Interviews with the villagers as well as local government and YKAN staff revealed the history of tourism development in the study sites. Tourism development in the villages on Maratua Island began when a resort company from the neighboring island of Derawan expanded their resort chain to one of the smaller islands within the jurisdiction of one of the villages. Tourism growth was also stimulated by the various CBET and CBT development programs conducted by multiple government agencies, companies, universities, and NGOs. Not all tourist accommodations, services, and attractions on the island are owned or managed by villagers. Resorts and cottages, especially, are oftentimes owned by foreigners or Indonesians who are non-residents of the island. Initially, these locales also did not open many job opportunities for the villagers. After complaints from the villagers and intervention from the village government, an agreement was reached and nowadays, although job openings in the resorts and cottages are still limited, more villagers are employed in these locales than before. Other villagers working in the tourism industry opened their own businesses or worked freelance. Other than formal tourism jobs, villagers could also get involved in local tourism interest groups.

Tourism development in Teluk Semanting, on the other hand, began around 2015, when an environmental non-profit organization worked together with the local village government to transform the village into an ecotourism village. After surveys were conducted to map out the village's tourism potential, the villagers collectively agreed to transform their village into an ecotourism village highlighting their mangrove forest as the main attraction. Over the years, Teluk Semanting has also received support in tourism development from multiple government agencies,

companies, universities, and NGOs. However, much of the tourism initiatives in the village, including the construction of some tourism facilities, were conducted through the collective action of the villagers, spearheaded by a group of youths from the village who are dedicated to protecting and managing the village's mangrove forest. Despite all the efforts to boost tourism, the village is yet to officially launch their mangrove ecotourism attraction. This is partly because the ecotourism attraction still did not have formal approval from the village government to charge entrance fees to tourists visiting the mangrove forest. A portion of the collected fees would have been used to provide a salary for those working in the tourist attraction (e.g., as tour guides) while another portion as revenue for the village. As a result, the youths from the mangrove management group were still not able to generate a steady income from the activity and make tourism their main occupation. Other villagers were involved in tourism by opening shops, homestays, and producing snacks that are marketed towards villagers and tourists alike.

Field observations and further interviews, complemented with a review of government and YKAN documents provided information on the extent of tourism development in the study sites, summarized in Table 3.1.

Table 3.1. Tourism development, infrastructure, and potential at Payung-Payung, Teluk Harapan, Bohe Silian, Teluk Alulu, and Teluk Semanting; "X" denotes the presence of the marine tourism potential, access, or infrastructure in the corresponding village

	Payung-Payung	Teluk Harapan	Teluk Semanting	Bohe Silian	Teluk Alulu
Marine tourism potential					
Beaches	X	X	X	X	X
Islands	X			X	X
Coral reefs	X	X		X	X
Mangrove	X	X	X	X	X
Caves	X	X		X	X
Lakes	X	X			
Access					
Water	X	X	X	X	X

Land			X		
Air	X				
Infrastructure					
Freshwater source	X	X	X	X	
Electricity	X	X	X	X	
Network coverage	X	X	X	X	X
Tourist accommodations					
Homestay	X	X	X	X	X
Inn	X	X			
Resort and cottage	X	X		X	X
Tourism village category					
MTCE	Developing	Developing	Developing	Pioneer	Pioneer
MMAF	Level 1				

Compiled from field observations, interviews, and data from Bohe Silian Village Government, 2021; Keputusan Direktur Jenderal Pengelolaan Ruang Laut Nomor 65 Tahun 2022 tentang Penetapan Desa Wisata Bahari; Payung-Payung Village Government, 2021; Teluk Harapan Village Government, 2021; Teluk Semanting Village Government, 2021; Tourism and Creative Economy Agency, n.d; Yayasan Konservasi Alam Nusantara, 2022.

The marine tourism potential across the four villages on Maratua Island includes coral reefs, beaches, outlying islands, lakes, caves, and mangrove forests, whereas Teluk Semanting only relies on its mangrove forest and beaches. All five villages can be accessed by sea. Payung-Payung has a small airport with a number of scheduled flights to the island through the week, making it the only village on Maratua Island that could also be accessed by air. Due to its location on the mainland, Teluk Semanting can also be accessed through land, although the roads surrounding the village have only been constructed in the past few years. Payung-Payung, Teluk Harapan, Teluk Semanting, and Bohe Silian all have their own source of freshwater, 24-hour electricity, and network coverage, though network coverage at Bohe Silian and Teluk Semanting is relatively weak. Teluk Alulu, on the other hand, only has network coverage, which at times is not stable. The village does not have its own source of freshwater and its villagers have to resort to collecting rainwater or obtaining it from the other villages on the island. Although the village does have electricity, it does not run for 24 hours. With regards to tourist accommodations,

Payung-Payung and Teluk Harapan have homestays, cottages, resorts, and inns, while Bohe Silian and Teluk Alulu do not have inns, and Teluk Semanting only has homestays. Part of the tourism revenue generated from these tourist accommodations as well as the sale of tickets for tourism attractions on Maratua Island are directed to the villages.

At the time of this research, all five villages were registered as tourism villages under the MTCE, but only Payung-Payung holds the title of marine tourism village under the MMAF. Comparing each villages' categorization as tourism villages under the MTCE and the MMAF's programs allowed for a more standardized comparison on the extent of tourism development in the five villages. Under the MTCE's tourism village program, villages are categorized in increasing level of tourism development as pioneer, developing, developed, and independent villages (Tourism and Creative Economy Agency, n.d). Payung-Payung, Teluk Harapan, and Teluk Semanting are categorized as developing villages, while Bohe Silian and Teluk Alulu are considered pioneer villages. The MMAF's tourism village program focuses on villages with marine tourism potential and gives participating villages a score of 1 to 5 based on level of tourism development, with a score of 5 assigned to marine tourism villages with the highest level of tourism development (Peraturan Menteri Kelautan dan Perikanan Republik Indonesia Nomor 93/Permen-KP/2020 tentang Desa Wisata Bahari). At the time of this research, only Payung-Payung is registered as a marine tourism village under this program and is categorized as a level 1 village.

The transition to tourism has led some residents of the study sites to get involved in tourism activities. All 55 respondents interviewed for this research have had at least some experience in a type of fisheries or tourism activity in their lifetimes (Table 3.2). Out of 55 respondents, 8 have only been involved in fisheries, 18 only in tourism, and 29 in both fisheries and tourism in their lifetimes. Respondents that have been involved in fisheries have an average experience of 21 years

(SD = 14.28 years, *n* = 29) in the industry, while those in tourism have an average experience of 7.69 years (SD = 5.97 years, *n* = 39) (Fig 2.1). Just by comparing the years of experience in the two industries, it is evident that tourism was introduced later into the villages as the respondents have fewer years of experience in the industry.

Table 3.2. Fisheries and tourism activities that respondents were involved in

Activities
Fisheries
Fish near shore
Fish far from shore
Process fish (e.g., salted fish and fish fillet)
Sell or transport fish or fish products to other islands
Buy fish or fish products from other individual fishers
Build fishing boats
Participate in fish aquaculture
Tourism
Own or work at a homestay or other types of accommodation for tourists
Own or work at a restaurant that is visited by tourists
Own or work at a tourist attraction or destination
Own or work at a store that is visited by tourists
Own or work at a travel agency
Produce packaged food that is bought by tourists
Produce crafts or other products that are bought by tourists
Own and rent transportation for tourists (e.g., car, motorcycle, boat)
Drive transportation for tourists (e.g., car, bus, boat)
Rent equipment for tourists (e.g., dive gear, camera)
Guide or escort tourists (e.g., dive guide, travel guide)
Work at a resort or other company that provides tourism services
Participate in tourism-related community events (e.g., interest group, volunteering)

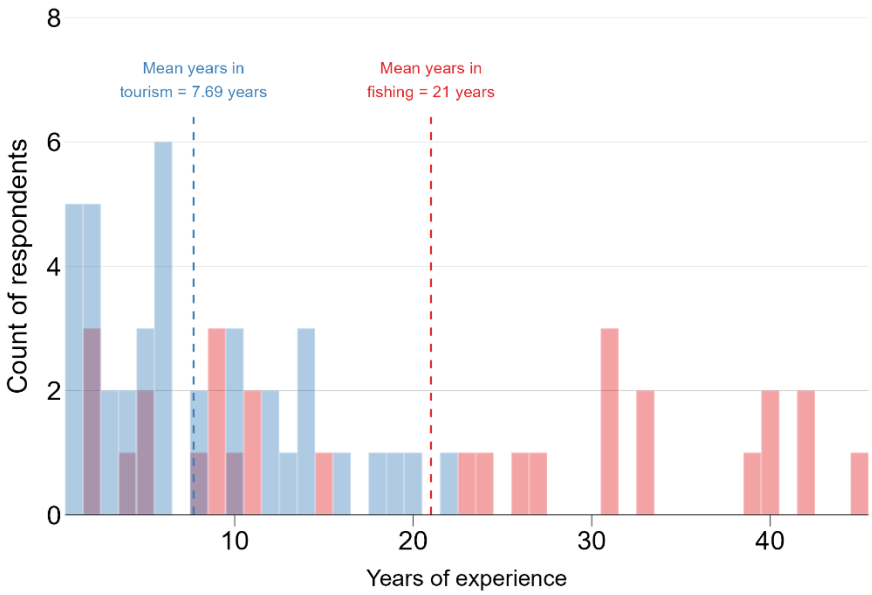

Figure 3.1. Distribution of years of fishing and tourism experience among respondents.

Of the 43 respondents who categorized their level of transition, 24 (55.81%) indicated that they felt that they have switched from fisheries to tourism, while 17 (39.53%) felt that they have not switched, and 2 (4.65%) felt that they were still in between or in the process of transitioning to tourism. When these responses were compared to the industries that respondents were involved in (Fig 3.2a), there is a clear pattern showing that involvement in tourism affects the respondents' feelings of switching to tourism. Respondents who have only been involved in fisheries did not feel like they have switched, whereas those who are only involved in tourism are more likely to feel like they have switched. There also appears to be a relationship between the respondents' major source of income and the feeling of switching (Figure 3.2b). Respondents who earned most of their income from tourism tend to feel like they have switched compared to those who earned more from fisheries.

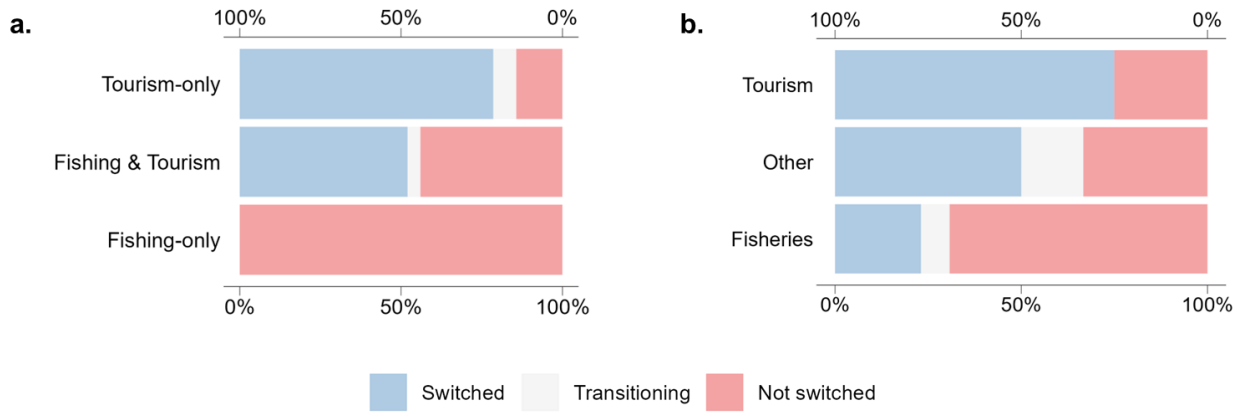

Figure 3.2. Comparison of feelings of "switching" to tourism with a) the types of activities respondents are involved in and b) their major source of income.

Upon a closer analysis of the reasons that respondents expressed for feeling like they have or have not switched to tourism, several respondents who felt that they have switched indicated that they felt so because they would choose tourism over fisheries activities. Other reasons expressed by the respondents are that they enjoyed being involved in tourism activities, received some sort of benefit from tourism (including financial benefits or income), were involved in tourism activities, or worked in a job that catered to tourists. On the other hand, respondents that do not feel like they have switched indicated the reasons they felt that way were because they were not interested in tourism activities, still involved in fisheries, and were not fully involved in tourism.

3.2 IMPACTS OF THE TRANSITION ON THE COMMUNITY

The overlapping use of resources, such as ocean space, between tourism and fisheries have resulted in some tension or conflict between the two industries. Several respondents from Maratua Island mentioned that in the past there had been a confrontation between fishers and divers who were

operating in the same area. To avoid future conflicts, the fishers and dive operators came to an agreement that fishers would only fish in the area during low tide, while divers will only dive during high tide. Another conflict that was mentioned involved the differing ways and impacts of the use of shared resources between individuals from the two industries. A respondent from Payung-Payung who worked at a tourist attraction in the village said that he once saw a fisher use bait soaked in potassium to fish near the entrance to the tourist attraction. Since then, the number of fish in the area has never been as abundant.

Tourism development may not always bring any tangible benefits or even cause disadvantage to the communities. From the interviews, some respondents on Maratua Island mentioned that many of the cottages and resorts are often owned by or preferred to hire people from other parts of Indonesia. It was only after complaints from the villagers and intervention of the local government that resorts and cottages began to increase local employment. At Teluk Semanting, several respondents said that the village was still not able to generate income from mangrove ecotours because they lacked the legal documents from the village government to authenticate the tourism activity. Without this document, fees imposed on tourists for the ecotours will be considered illegal fees. As a result, some respondents were discouraged from continuing to work on the mangrove ecotours because they preferred to take other occupations where they could actually generate income to support their living. It was also mentioned that on Maratua Island, some residents have started to sell off their land to investors to make way for more tourism businesses.

Lastly, our interviews reflected the potential for a loss of local fishing knowledge as a result of the transition. Although all five villages have long been known as fishing villages and their residents have lived off of the ocean’s resources for generations, when asked if they would pass

on the knowledge of tourism or fisheries to the next generation, only 2 out of 47 respondents (4.26%) indicated that they would pass down their fishing knowledge, while 6 respondents (12.77%) chose both fishing and tourism , 9 respondents (19.15%) would pass down knowledge of tourism, and 30 respondents (63.83%) chose neither. Many respondents said that they would encourage the younger generation to focus on education. Some even did not want the next generation to be fishers. A fisher from Bohe Silian said it is hard to be a fisher. If his children and grandchildren have the opportunity, they should continue their education, otherwise they can pick up a fishing rod. The activities that respondents were involved in (Fig 3.3a) and their major source of income (Fig 3.3b) did not appear to affect how respondents answered this question.

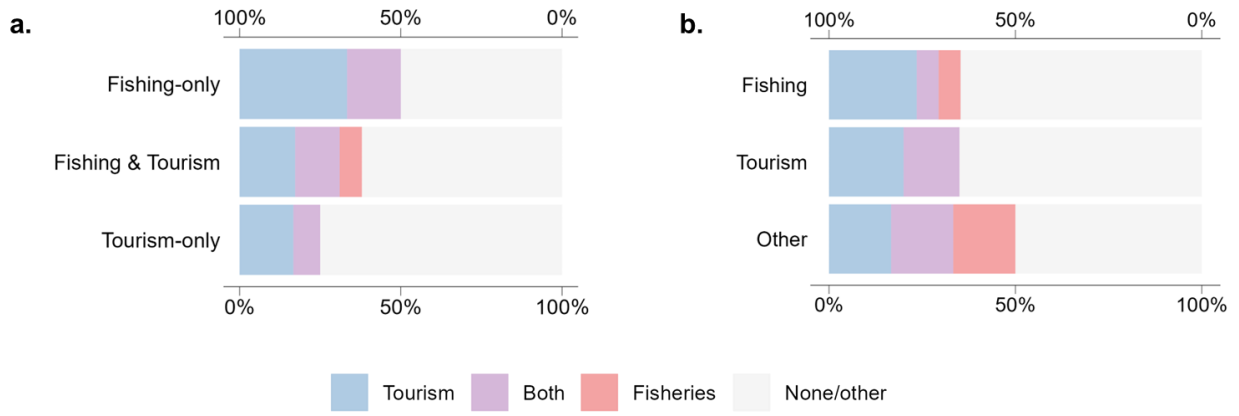

Figure 3.3. Knowledge that respondents would like to pass on to the next generations compared with a) the types of activities respondents are involved in and b) their major source of income.

3.3 IMPACTS OF THE TRANSITION ON THE ENVIRONMENT

In the interviews, the respondents were asked about the environmental impacts of fisheries and tourism. 16 out of 43 respondents (37.21%) viewed fisheries as more harmful to the environment, while 13 respondents (30.23%) chose neither, 9 respondents (20.93%) viewed both as equally

harmful, and 5 respondents (11.63%) chose tourism. These responses were compared to the activities that they were involved in (Fig 3.4a) and their major source of income (Fig 3.4b). These comparisons also show that fisheries was generally viewed as the more harmful industry to the environment. Despite having generally more favorable views, tourism also has some negative impacts which may be less obvious or even unseen such as the increased demand for resources. For example, interviews and observations revealed that the availability of freshwater, which is a basic need, is already a problem in Teluk Alulu as the village does not even have its own source of freshwater and the villagers are already struggling just to meet their daily needs. This issue may be exacerbated as more tourists come to the village, further raising the demand for freshwater.

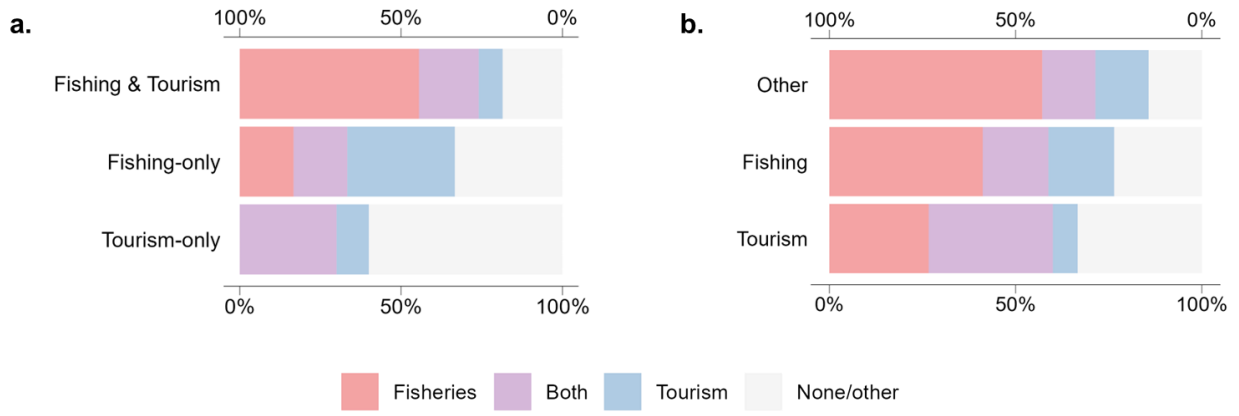

Figure 3.4. The industry that is viewed as more harmful to the environment compared with a) the types of activities respondents are involved in and b) their major source of income.

Given the strong overlap between respondents' feeling of transitioning, type of industries involved in, and main source of income, it was decided that only one of those metrics (source of income) was needed to assess how it impacts the current fishing effort of respondents. Figure 3.5 shows that respondents who received a majority of their income from fisheries were exerting a

wider range of fishing effort, which could be attributed to the use of a wider variety of fishing gear and varying fishing patterns. On the other hand, respondents who received a majority of their income from tourism have very low fishing effort score, implying more selective fishing gear and less time spent on fishing.

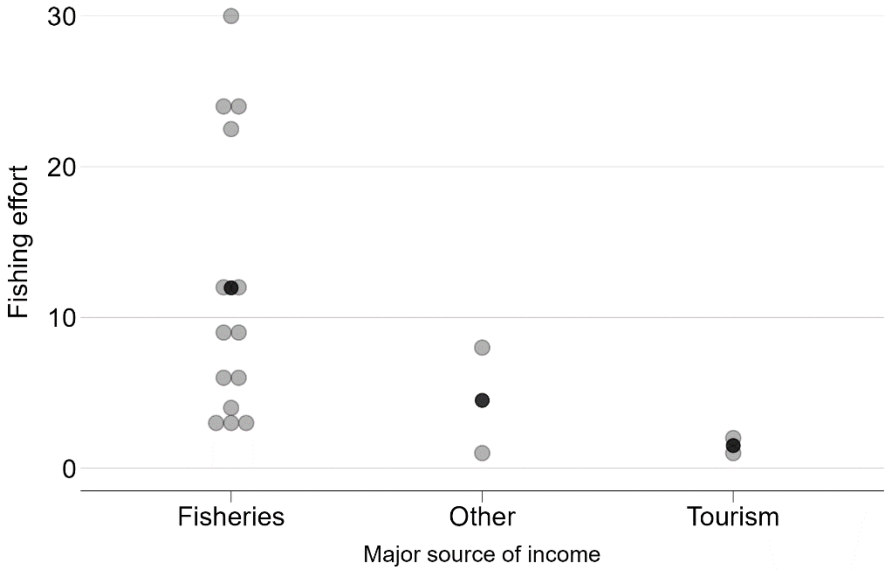

Figure 3.5. Relationship between fishing effort and major source of income. Each gray dot represents one respondent. The black dots represent the mean fishing effort for each category.

3.4 IMPACTS OF THE TRANSITION ON THE INDIVIDUAL'S CAPACITY TO RESPOND TO THE COVID-19 PANDEMIC

We investigated the individual's capacity to respond to the COVID-19 pandemic according to their level of involvement in both the tourism and fisheries sector. The tourism sector is generally thought to be most impacted by the pandemic, but interviews with the respondents indicated that the pandemic also impacted the fisheries sector in the study sites (Table 3.3).

Table 3.3. Impacts of COVID-19 on tourism and fisheries

Impact on tourism
Change in work pattern
Closing of the tourism industry
Financial aid
Tourism business slowed
Turn to fishing
Minimum to no impact
Impact on fisheries
Fish sold at lower price
Financial aid
Hard to sell fish
Minimum to no impact
Destructive fishing

The main impact of COVID-19 pandemic on tourism expressed by a majority of the respondents was the closing down of the tourism industry. In March of 2020, the Indonesian government implemented a large-scale social restriction to prevent the further spread of the COVID-19 virus, shutting down public places and restricting travel (Peraturan Pemerintah Republik Indonesia Nomor 21 tahun 2020 tentang Pembatasan Sosial Berskala Besar dalam Rangka Percepatan Penangangan Corona Virus Disease 2019 (COVID-19)). On Maratua Island, the tourism industry came to a halt and even until the time of the data collection, some resorts and tourism attractions on the island were still yet to reopen. As a result, no tourists were able to reach the four villages on Maratua Island. A respondent from Teluk Harapan mentioned that the tourists who were somehow able to get to the island were asked to leave by the authorities. The authorities were also strict with tourist operators. According to a respondent from Payung-Payung, he had to close the tourism attraction where he worked to avoid getting fined.

Due to the closing of the tourism industry and lack of tourists, resorts on Maratua Island had to make changes in their daily operations which impacted their employees. One respondent observed that those that work at resorts on a day-to-day basis or without a contract were let go,

whereas those with contracts were able to keep their jobs but only received basic salaries. Other respondents mentioned that they were able to keep their jobs but had to carry out tasks that were out of their regular job descriptions. For instance, a respondent from Bohe Silian who worked in the laundry, garden, and kitchen of a resort mentioned that during the pandemic, her job turned to cleaning. She said that this change in roles was still better than being let go by her employers.

Some respondents who ran their own businesses mentioned that throughout the pandemic, they were still able to continue although business was slow. One example is a respondent from Teluk Harapan who owned a store selling groceries for residents, but also sold souvenirs and rented out equipment and transportation for tourists. During the pandemic, he was still able to open his shop and earn half of his regular revenue by selling groceries. A restaurant owner from Teluk Harapan said that he was still taking take-away orders, but sales were lower than pre-pandemic times. Respondents who produced snacks to sell to both locals and tourists slowed down production due to lower demand. Snack producers on Maratua Island resorted to only producing snacks based on orders. A respondent in Teluk Semanting, on the other hand, took advantage of their location on the mainland and sold their products in a bigger town with the help of relatives in the area.

Some respondents had to completely stop their jobs. Multiple respondents who owned tourist accommodations mentioned that no tourists came at all. A speedboat owner from Teluk Harapan that would usually transport tourists from the mainland to Maratua Island had to completely stop his operations. He turned to fishing and was trusted to tend a friend’s garden during the pandemic. He said that although his family did not have any income, at the very least they still had food to eat. He was one of several respondents that indicated that they themselves or

people that they know of who were working in the tourism industry turned to fishing during the pandemic.

Several respondents talked of financial aid during the time of the pandemic. One respondent who owns an inn in Teluk Harapan said that he did not receive financial aid because his business was considered to be doing alright. The restaurant owner from Teluk Harapan mentioned that his family received financial aid on three occasions. He and his wife each received general financial aid from the village. Other than that, they also received financial aid for businesses impacted by the COVID-19 pandemic. However, he had to travel all the way to the mainland to submit paperwork and receive this aid.

There were several respondents who said that the COVID-19 pandemic had minimum to no impact on their tourism activities. Among them was a respondent from Teluk Semanting who did not work in the tourism sector but was an active member of the village's mangrove management group. According to the respondent, the pandemic did not cause a big impact to tourism in Teluk Semanting because at the time the pandemic began, the village's ecotourism initiative was still not fully launched. They were still in the process of developing facilities and infrastructure for tourism and not receiving much income from tourism yet so the lack of tourists due to the pandemic did not make a big difference.

The impact of the COVID-19 pandemic on the fisheries industry that was most mentioned by respondents was that it became hard to sell fish. Due to the restrictions that were put in place during the pandemic, fishers had limited access to markets outside of their villages. Several respondents from Bohe Silian said that during the pandemic, ships that would come to the island to load fish to be exported to Hong Kong were not coming. This was echoed by a respondent from

Payung-Payung that said that fishers who caught live fish to be exported to Hong Kong were not able to sell fish for around a year.

Within the village, some respondents said that some fishmongers stopped buying fish, partly because they were not able to take the fish to a bigger market to sell. Selling fish to other villagers also became difficult because almost everyone started fishing for themselves during the pandemic. Some respondents took it into their own hands to try and sell their catch outside the village. A respondent from Teluk Semanting went to the neighboring village of Kasai to sell his fish. A respondent from Teluk Alulu who fishes and was also a fishmonger said that he was still able to sell fish on the mainland, but he would have to spend money to rent the boat to transport the fish. On Maratua Island, where fishers used to be able to sell fish to resorts, some respondents mentioned that resorts stopped buying fish because there were no tourists coming to the resorts in the first place. However, one respondent from Teluk Alulu mentioned that fishers did not regularly sell their catch to resorts even before the pandemic.

Another big impact of the pandemic on the fisheries industry was the drop in fish prices which was related to the closure of the markets. The most extreme case of a price drop was told by a respondent from Teluk Alulu who said that the fish prices dropped to a tenth of their pre-pandemic prices. A respondent from Teluk Semanting said that this drop in prices was especially hard for fishers who target high-quality fish as they were not able to sell to their usual buyers, whereas selling them in a regular market would not cover the operational cost of catching the fish. An octopus fisherman from Bohe Silian said that during the time of data collection, the prices of octopus still had not returned to pre-pandemic levels.

During the pandemic, several respondents working in the fisheries industry also changed their work patterns. Due to a combination of the difficulty in selling fish and the lower price of

fish, some fishers said that they reduced their fishing time or even stopped fishing for some time. A respondent from Payung-Payung who worked to build fishing boats stopped operations during the pandemic. He said that although he could have technically continued building boats, he was worried that no one would purchase them, so he started fishing for lobster and octopus to sell to other villagers. Several respondents mentioned financial aid being distributed by the government. It was unclear if the financial aid was specifically given to people working in the fisheries industry whose work was impacted by the pandemic. However, a respondent from Bohe Silian mentioned that not everyone received financial aid, including herself.

There were two mentions of destructive fishing occurring during the COVID-19 pandemic, both from respondents from Maratua Island. One was mentioned by a respondent from Payung-Payung who worked as a freelance dive guide and is a member of a community environmental and tourism organization. He mentioned that during the pandemic some people used any method possible to get fish in order to survive, though it was unclear who were the people he was referring to. Another mention of destructive fishing was also from a respondent from Payung-Payung who worked in the village government but was actively involved in the same community environmental and tourism organization. He mentioned that during the pandemic, those working as guides for tourists did not have any source of income and resorted to fishing with potassium.

Chapter 4. DISCUSSION

In all of the study sites, tourism development has been primarily driven by external agents, with different levels of community involvement. The development of cottages and resorts on Maratua Island seems to target large-scale tourism, whereas other tourism development programs in all five villages aimed for CBET or CBT. While the origin of tourism development in CBT does not necessarily have to be internal or from within the community, community participation and involvement is crucial (Giampiccoli & Saayman, 2018; Mtapuri & Giampiccoli, 2016). Giampiccoli and Saayman (2018) stated that:

> At the same time, while the level of involvement is fundamental, the need is to go beyond involvement or participation. True CBT is about people initiating, owing and controlling the development process from the beginning. It is not about their participation if the process is controlled by outside entities. The issue is how to assist them to develop the CBT process themselves, not to make them participate in it. External entities can be useful in facilitating CBT development if they participate by assisting the community. (p. 9)

Thus, it is important for government agencies, as well as public and private sectors to reassess their CBET development programs to ensure that the programs allow for and result in the communities self-directed participation, not because they were instructed to do so.

Although all five villages had different tourism potential and supporting infrastructure and were at different stages of development (Table 3.1), this research showed that all the villages could still benefit from continued support to further stimulate tourism growth. During the interviews, respondents mentioned funding, the strengthening of infrastructure, the provision of facilities and

equipment, governmental support, increased opportunities and inclusivity, as well as continued training and facilitation as some of the types of support they viewed as necessary to further tourism development in their communities. A wealth of literature already exists and may be referred to for tips and best practices for CBT development (e.g., Hamzah, 2014; Hamzah & Khalifah, 2009). In the short term, the support may focus on strengthening basic infrastructure and facilities such as the issue of freshwater supply in Teluk Alulu and weak network coverage in Teluk Alulu, Bohe Silian, and Teluk Semanting. However, in the long term, in order to become truly successful CBT initiatives, the support should focus on increasing tourism value to further increase yield, helping the communities become more self-reliant, and creating more opportunities for self-improvement and career growth for community members (Hamzah, 2014).

Another aspect of tourism development that is important to consider is the order of priorities in the tourism development initiatives in the five villages. Tourism development on Maratua Island began with the development of resorts which capitalized on the island's marine tourism potential followed by efforts from government agencies, universities, and NGOs to work together with the local communities to improve community livelihood through developing tourism as a sustainable alternative livelihood. Priority is given to economic growth, followed by environmental sustainability and social well-being. In Teluk Semanting, on the other hand, upon realizing the economic potential and environmental benefits of maintaining their mangrove forest, the villagers began efforts to preserve the forest with the hopes that the mangrove ecotourism program would bring income and prosperity to the village. This pathway prioritizes environmental protection, which is expected to bring economic growth, leading to increased social well-being. While there is no one correct way to develop tourism, communities may benefit more when their well-being is prioritized over other goals or concerns. This can be achieved by applying the Social

Well-being model proposed by Ota et al. (2022), which puts social well-being as the focus, followed by environmental protection and economic growth. This bottom-up approach can be implemented by involving communities in tourism-related decision-making processes so that they themselves may voice how tourism in their area should be developed in a way that better meets their priorities and concerns. Implementing this approach for tourism development will also help to ensure that social equity is achieved, and not just considered an afterthought, if tourism is to truly be one of the main pillars driving the Blue Economy agenda.

As the global tourism industry continues to grow, more people can be expected to participate in the industry, potentially leaving behind older and more traditional forms of livelihoods as well as exposing communities to new opportunities and vulnerabilities. The findings from this research provide a glimpse into the dynamics between the fisheries and tourism industries in communities that are transitioning to tourism. Interviews with the respondents indicated that in the past there was some tension between fishers and tourism operators regarding the shared use of ocean space which they were eventually able to resolve through a joint agreement. Tension between fishers and tourism operators due to competition and different use priorities of shared space and resources have also been observed in other locations (e.g., de Andrade & de Oliveira Soares, 2017; Fabinyi, 2008). To avoid future conflicts and promote a harmonious coexistence between both industries, Lachs and Oñate-Casado (2020) propose that fisheries and tourism industry actors should both be involved in collaboratively and sustainably managing the shared marine resources.

Amid tourism development, there are still strong needs and opportunities for fisheries. Fisheries plays a crucial role in meeting the seafood demand of local residents, which mostly comprise of “small low trophic level demersal fish species”, and that of tourists which targets more

high value fish and invertebrates (Garcia Rodrigues & Villasante, 2016). This problem of seafood supply was already observed in Teluk Semanting, where a respondent expressed difficulties in procuring the specific species of fish to produce snacks to be sold to both local villagers and tourists and can be expected to worsen if more and more villagers transition away from fishing or if fishing skills are not taught to the next generations. Other than to meet seafood demand, maintaining fisheries skills and knowledge, especially of sustainable fishing methods, is also important if a return to fishing is someday needed, such as during the COVID-19 pandemic when villagers had to find new sources of income to cope with the shock. Limited knowledge of fishing would limit the ability of communities to rely on fisheries to cope with shocks (Eriksson, 2017).

In this research, the respondents generally viewed tourism as less harmful to the environment compared to fisheries (Fig 3.4). These views may have been the case because there are impacts, including negative impacts, from tourism that may be less obvious or even unseen by the residents of the five study sites, especially those who are not directly involved in tourism activities. Several environmental impacts of tourism include excessive land use change, waste generation, and pollution (Gazta, 2018; Gössling, 2001; Lachs and Oñate-Casado, 2020). As tourism continues to grow in the five villages, the environmental impacts of tourism will need to be monitored closely to ensure that its impact on the surrounding environment may be minimized.

The results also show that the transition from fisheries to tourism led to reduced environmental impacts from lower fishing effort by respondents who earned most of their income through tourism (Fig 3.5). However, caution should be taken in interpreting this finding as this research only captured a snapshot of fishing efforts at a single point in time while the relationship between fishing and tourism is much more complex and dynamic (Carter & Garaway, 2013). Other than for sustenance or as a primary source of income, fishing may also be purposed for other

purposes such as to complement other livelihood options or for recreation (Smith et al., 2005). Thus, an individual's level of participation and purpose for participating in fisheries may fluctuate over time (Carter & Garaway, 2013). The impact of the transition to fishing effort at a community level should also be considered to fully understand the impact of the transition to fishing efforts.

The COVID-19 pandemic was a shock that affected both the tourism and fisheries industries in the five villages (Table 3.3). Most respondents were still able to continue their activities despite lower productivity and slight changes in working patterns, in some cases also through the help of financial aid. However, there were also those who returned to fishing or resorted to destructive fishing practices as coping mechanisms. Coping essentially refers to the way that people manage available resources to fulfill their needs, but it is often used in the context of urgent and unfavorable situations such as shocks (Davies, 1993; Wisner et al., 2003). Income diversification is one of a sequence of actions that households often take to cope with shocks (Ellis, 2000). Individuals working in the tourism industry who returned to fishing during the pandemic displayed a form of income diversification. Considering the abundance of available marine resources, fisheries was an accessible source of alternative income for individuals working in the tourism industry whose livelihoods were heavily impacted by the COVID-19 pandemic. This strategy of coping through fisheries has also been observed in other coastal communities whose main livelihoods were impacted by shock (Eriksson et al., 2017). Although during this time, the sales of fish in the five villages were also impacted by the pandemic, at the very least, individuals could still fish for sustenance.

Although throughout the interviews, most respondents mentioned that villagers in their communities are generally aware of the dangers of destructive fishing methods and do not practice them, it was not entirely surprising to hear accounts of destructive fishing during the COVID-19

pandemic. Coping strategies are not always sustainable and may even lead to environmental degradation (Davies, 1993). In fact, a study by Ahmed et al. (2019) shows that stresses that impact livelihood options may lead people to pursue income from illegal activities, including those that cause environmental damage. This behavior can also be described as a form of delay discounting, a phenomenon where “smaller rewards with shorter delays are preferred to larger rewards with longer delays” (Tesch and Sanfey, 2008). In the case of the individuals on Maratua Island who reportedly engaged in destructive fishing, getting an immediate but relatively small income through unsustainable fishing methods would contribute to their immediate survival and thus had a greater appeal compared to preserving the marine environment which may lead to greater fish yield and income as well as other environmental benefits in the future.

Chapter 5. CONCLUSION

The findings show that most of the respondents were actually engaged in both fisheries and tourism, instead of just one of the two. Involvement in and income from tourism affect whether respondents feel like they have switched to tourism. The development of tourism in the five villages may lead to potential conflicts between fisheries and tourism as well as raise issues due to the lack of benefits and loss of ownership among community members. Another notable finding was that despite the generally positive outlook on tourism development, most respondents did not want to pass on knowledge of fisheries or tourism to the next generation and would prefer them to pursue other opportunities. With regards to the impacts of the transition to the environment, overall, the respondents viewed fisheries as more harmful to the environment. The results also show that respondents who earn most of their income from tourism exert less fishing effort compared to those who earn more from fisheries. The case study of the COVID-19 pandemic showed that both tourism and fisheries were impacted by COVID-19 and that returning to fisheries is a form of coping strategy through income diversification, though sometimes they come in the form of destructive fishing practices. Based on these findings, the following recommendations are suggested to further develop tourism in the five villages that truly aims for social equity, environmental sustainability, and economic development.

The first recommendation is to promote the coexistence of tourism and fisheries. Most respondents are involved in both fishing and tourism rather than completely switching to one activity. Some pitfalls to this coexistence are the potential conflicts that may arise over the use of shared resources, such as that of shared space which was discussed in this research. Nevertheless, maintaining fisheries is still important as it plays a role in meeting the communities' seafood demand and may also become a strategy for coping with shocks. Thus, local government agencies

and organizations supporting tourism development should consider and encourage the coexistence of tourism and fisheries in their policies and programs. These policies and programs should not only discuss ways to share resources and avoid conflicts, but also strive to create opportunities for collaboration among the two industries. This research mainly focuses on the transition from capture fisheries to tourism at the individual level. However, it is also important to consider the impacts of the transition at the community-level.

Secondly, tourism development should prioritize social well-being above environmental conservation and economic growth. This research has shown that the transition to tourism has led to a reduction in fishing pressure. However, it has also shown that the impact of the transition goes beyond the environment and that it also has social implications to the communities. It is therefore important to continuously engage with the local communities and provide them with opportunities to share their views throughout the tourism development process. That way, communities will be able to fully express how they would like to be involved in and the types of benefits that they would like to get out of tourism development. Great attention should also be given to communities' participation and involvement in tourism development if the aim is to develop CBET or CBT. Tourism development policies and programs should also consider other environmental impacts of tourism as in the long-term, some of these environmental impacts may also have their own impacts to the communities.

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Human Subjects Research Compliance Information

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Conflicts of Interest

There are no conflicts of interest to declare in this research.

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APPENDIX A

Blue Transition
Interview Questionnaire
Indonesia – 2022

Location	
Date	
Duration (min.)	

Interview Number	
Interviewee ID	
Interviewer	

A. Individual Participation

Please indicate the age in which you and/or your partner started and/or stopped participating in the following activities. ***Note:*** *Write "**X**" under **Start** if the interviewee has never participated in the activity, "**O**" under **Stop** if still participating in the activity.*

No.	Fishing-Related Activities	Start	Stop
1	Harvest fish from the ocean.		
2	Harvest fish from the shore.		
3	Process fish harvested from the ocean.		
4	Package fish harvested from the ocean.		
5	Own a boat that is used mainly for harvesting or transporting fish.		
6	Own a facility that is used mainly for growing or keeping live fish.		
7	Participate in the selling or buying of fish in large quantities.		
8	Other fishing-related activities:		
9	Having at least one of the above-mentioned activities as a main source of income. *Circle the number to indicate which activities*.		
10	Why did you have it as your main source of income?		
11	Why did you stop having it as your main source of income?		

No.	Tourism-Related Activities	Start	Stop
12	Own a homestay or lodging for tourists.		
13	Own a restaurant where the main customers are tourists.		
14	Cook food mainly consumed by tourists.		
15	Own a shop (groceries, crafts, etc.) where the main customers are tourists.		
16	Create products that are mainly consumed by tourists.		
17	Own or drives vehicles (car, boats, etc.) that transports tourists.		
18	Assist or guide tourist activities (tour, diving, birdwatching, etc.).		
19	Other tourism-related activities:		
20	Having at least one of the above-mentioned activities as their main source of income. *Circle the number to indicate which activities*.		
21	Why did you have it as your main source of income?		
22	Why did you stop having it as your main source of income?		

B. Individual-Level Changes

Please answer the following questions for when the activity was (**Main**) and was not (**Not**) your main source of income.

No.	Fishing-Related Activities	Main	Not
1	How many days per week do you dedicate to this activity?		
2	How many hours per day do you dedicate to this activity?		
3	How many of these do you have and utilize to support this activity?		
3a	Boat		
	Small boat without engine		
	Small boat with engine		
	Large boat with engine		
	Other:		
3b	Fishing-related gear		
	Hook and line		
	Fish net		
	Fish fence		
	Purse seine		
	Other:		
3c	Colleagues		
3d	Buildings		
	Kitchen (other than personal)		
	Storage area		
	Shop or stall		
	Other:		
3e	Other:		
4	How many kilograms of fish do you harvest per day?		
5	What species did you harvest when fishing was/is …		
	… your main income?	… not your main income?	

No.	Tourism-Related Activities	Main	Not
6	How many days per week do you dedicate to this activity?		
7	How many hours per day do you dedicate to this activity?		
8	How many of these do you have and utilize to support this activity?		
8a	Boat		
	Small boat without engine		
	Small boat with engine		
	Large boat with engine		
	Other:		
8b	Tourism-related gear		
8c	Colleagues		
8d	Buildings		
	Kitchen (other than personal)		
	Tourist accommodation		
	Shop or stall		
	Other:		
8e	Other:		
9	How many tourists do you interact with per day?		
10	What activities did you facilitate when tourism was/is...		
	… your main income?	… not your main income?	

C. Community-Level Changes

Please indicate what changes have you observed in the following areas in the last 5 years.
Note: *Circle "↑" for an increasing trend, "↓" for a decreasing trend, or both for no change.*

Fisheries-Related Observations			
1	Number of people participating in fisheries-related activities.	↑	↓
2	Total fish landings in the community.	↑	↓
3	Competition to participate in fisheries-related activities.	↑	↓
4	Number of rituals or ceremonies performed in relation to fishing.	↑	↓
Tourism-Related Observations			
5	Number of people participating in tourism-related activities.	↑	↓

6	Number of visiting tourists.	↑	↓
7	Competition to participate in tourism-related activities.	↑	↓
8	Number of rituals or ceremonies performed to attract or entertain tourists.	↑	↓
Environmental (Fish Stocks) Observations			
9	Environmental quality (mangroves, coral reefs, etc.)	↑	↓
10	Abundance of fish in the sea.	↑	↓
11	Variety of fish species found in the sea.	↑	↓
12	Variety of fish species harvested.	↑	↓
13	Abundance of non-fish species in the sea.	↑	↓
14	Variety of non-fish species found in the sea.	↑	↓
15	Variety of non-fish species harvested.	↑	↓
16	Size of fish harvested.	↑	↓

D. Capture Fisheries vs. Community-Based Marine Tourism

On a scale of 1 to 5, please indicate which industry is more relevant to each of the following statements at present.
Note: *Circle the appropriate number.* ***1*** *– Fisheries;* ***3*** *– 50/50 between fisheries and tourism;* ***5*** *– Tourism.*

No.	**Time and Resource Investment**	**Fisheries…50/50…Tourism**					**Other**
1	I spend most of my time doing this activity.	1	2	3	4	5	
2	I spend more money to invest on this activity.	1	2	3	4	5	
3	I require more equipment to conduct this activity.	1	2	3	4	5	
4	I have more support from …	1	2	3	4	5	
4a	… the government to conduct this activity.	1	2	3	4	5	
4b	… other community members to conduct this activity.	1	2	3	4	5	
4c	… a third party (NGO, private sector, etc.) to conduct this activity.	1	2	3	4	5	
5	I want to pass down my knowledge and/or experience related to this activity to the next generation.	1	2	3	4	5	
No.	**Economic Outcomes**	**Fisheries…50/50…Tourism**					**Other**
6	I earn more money doing this activity.	1	2	3	4	5	
7	The amount of money gained for this activity is enough to …	1	2	3	4	5	
7a	… provide food and shelter for my family.	1	2	3	4	5	
7b	… provide education for my family.	1	2	3	4	5	
7c	… allow me to contribute to my community (religious offerings, help a community member in need, etc.).	1	2	3	4	5	
7d	… allow me to pursue other activities (hobbies, interests, etc.).	1	2	3	4	5	
7e	… allow me to secure funds for emergencies.	1	2	3	4	5	
No.	**Social Wellbeing**	**Fisheries…50/50…Tourism**					**Other**
8	I enjoy doing this activity more.	1	2	3	4	5	
9	I feel safer doing this activity.	1	2	3	4	5	
10	I get to make more of my own decisions in this activity.	1	2	3	4	5	
11	I interact with more people doing this activity.	1	2	3	4	5	
12	This activity allows me to balance time between work and leisure.	1	2	3	4	5	
No.	**Environmental Significance**	**Fisheries…50/50…Tourism**					**Other**
13a	This activity causes more harm to the environment.	1	2	3	4	5	
13b	Why?						
14a	This activity is more beneficial to the environment.	1	2	3	4	5	
14b	Why?						

15	This activity allows me to connect more with the environment.	1	2	3	4	5	

E. Understanding Transition

Note: *For questions 2a, 3a, 4a, and 5a, circle the appropriate response.*

No.	Transition to Community-Based Marine Tourism		
1	Based on your understanding, what is community-based marine tourism?		
2a	Do you think that you have transitioned to community-based marine tourism?	Yes	No
2b	Why?		
3a	Do you think that your community has transitioned to community-based marine tourism?	Yes	No
3b	Why?		
4a	Did you have agency over the presence or lack thereof of this transition?	Yes	No
4b	Why?		
5a	Are you content with the presence or lack thereof of this transition?	Yes	No
5b	Why?		
6	What ecotourism potential is present in your area that you think would be attractive to tourists? Why?		
7	What kind of support do you think would be helpful for you or people who would like to transition to community-based marine tourism? (e.g., skills training, facilities)		

F. Resilience and Adaptive Capacity

Resilience and Adaptive Capacity	
1	How did the COVID-19 pandemic affect capture fisheries activities?
2	How did the COVID-19 pandemic affect your income from capture fisheries?

3	What did you do to overcome the effects of the COVID-19 pandemic on capture fisheries?
4	How did the COVID-19 pandemic affect community-based marine tourism activities?
5	How did the COVID-19 pandemic affect your income from community-based marine tourism?
6	What did you do to overcome the effects of the COVID-19 pandemic on community-based marine tourism?

G. Perception and Hopes

Please choose 1-3 words that you associate with capture fisheries, community-based marine tourism, and environment.

Note: *Circle the words selected by the interviewee.*

Capture Fisheries	
Happiness	Sadness
Pride	Shame
Hopeful	Hopeless
Culture	Education
Religion	Safety
Security	Identity
Future	Past
Family	Politics
Other:	
Why?	

Community-Based Marine Tourism	
Happiness	Sadness
Pride	Shame
Hopeful	Hopeless
Culture	Education
Religion	Safety
Security	Identity
Future	Past
Family	Politics
Other:	
Why?	

Environment	
Happiness	Sadness
Pride	Shame
Hopeful	Hopeless
Culture	Education
Religion	Safety
Security	Identity
Future	Past
Family	Politics
Other:	
Why?	

H. Background Information

Note: *For multiple choice questions, write "**X**" in the appropriate box.*

No.	**Question**	**Answer**	
1	Age		
3a	Main occupation		Fishing
			Tourism

No.	**Question**	**Answer**	
2	No. of people in household		
4a	Secondary occupation (if available)		Fishing
			Tourism

			Other:				Other:
3b	Contribution from main occupation towards monthly income		100%	4b	Contribution from secondary occupation towards monthly income		100%
			75% - 99%				75% - 99%
			50% - 74%				50% - 74%
			25% - 49%				25% - 49%
			< 25%				< 25%
5	Gender		Male	6	Interviewee recommendations:		
			Female				
			Other				
Miscellaneous notes:							

APPENDIX B

Table A.1. Feelings of "switching" to tourism

Have you "switched" to tourism?	*n*	%
Yes	24	55.81 %
Transitioning	2	4.65 %
No	17	39.53 %
(No answer)	12	

Table A.2. Comparison of feelings of "switching" to tourism with activities involved in

Have you "switched" to tourism?	*n*	%
Only involved in tourism		
Yes	11	78.52 %
Transitioning	1	7.14 %
No	2	14.29 %
(No answer)	4	
Involved in fishing and tourism		
Yes	13	52.00 %
Transitioning	1	4.00 %
No	11	44.00 %
(No answer)	4	
Only involved in fishing		
Yes	0	0.00 %
Transitioning	0	0.00 %
No	4	100.00 %
(No answer)	4	

Table A.3. Comparison of feelings of "switching" to tourism with major source of income

Have you "switched" to tourism?	*n*	%
Main income from tourism		
Yes	15	75.00 %
Transitioning	0	0.00 %
No	5	25.00 %
(No answer)	3	
Main income from other industries		
Yes	3	50.00 %
Transitioning	1	16.67 %
No	2	33.33 %
(No answer)	2	
Main income from fisheries		
Yes	3	23.08 %
Transitioning	1	7.69 %
No	9	69.23 %
(No answer)	6	
Main income unknown		
Yes	3	
Transitioning	0	
No	1	
(No answer)	1	

Table A.4. Knowledge that respondents would like to pass on to the next generations

I want to pass down my knowledge and/or experience related to this activity to the next generation.	*n*	%
None or other	30	63.83 %
Tourism	9	19.15 %
Fishing and tourism	6	12.77 %
Fisheries	2	4.26 %
(No answer)	8	

Table A.5. Knowledge that respondents would like to pass on to the next generations compared with activities involved in

I want to pass down my knowledge and/or experience related to this activity to the next generation.	*n*	%
Only involved in tourism		
None or other	9	75.00 %
Tourism	2	16.67 %
Fishing and tourism	1	8.33 %
Fisheries	0	0.00 %
(No answer)	6	
Involved in fishing and tourism		
None or other	18	62.07 %
Tourism	5	17.24 %
Fishing and tourism	4	13.79 %
Fisheries	2	6.90 %
(No answer)	0	
Only involved in fishing		
None or other	3	50.00 %
Tourism	2	33.33 %
Fishing and tourism	1	16.67 %
Fisheries	0	0.00 %
(No answer)	2	

Table A.6. Knowledge that respondents would like to pass on to the next generations compared with major source of income

I want to pass down my knowledge and/or experience related to this activity to the next generation.	*n*	%
Main income from tourism		
None or other	13	65.00 %
Tourism	4	20.00 %
Fishing and tourism	3	15.00 %
Fisheries	0	0.00 %
(No answer)	3	
Main income from other industries		
None or other	3	50.00 %
Tourism	1	16.67 %
Fishing and tourism	1	16.67 %
Fisheries	1	16.67 %
(No answer)	2	
Main income from fisheries		
None or other	11	64.71 %
Tourism	4	23.53 %
Fishing and tourism	1	5.88 %
Fisheries	1	5.88 %
(No answer)	2	
Main income unknown		
None or other	3	
Tourism	0	
Fishing and tourism	1	
Fisheries	0	
(No answer)	1	

Table A.7. The industry that respondents viewed as more harmful to the environment

This activity causes more harm to the environment.	*n*	%
Fisheries	16	37.21 %
None or other	13	30.23 %
Fishing and tourism	9	20.93 %
Tourism	5	11.63 %
(No answer)	12	

Table A.8. The industry that respondents viewed as more harmful to the environment compared with activities involved in

This activity causes more harm to the environment.	*n*	%
Only involved in tourism		
None or other	6	60.00 %
Fisheries	0	0.00 %
Fishing and tourism	3	30.00 %
Tourism	1	10.00 %
(No answer)	8	
Involved in fishing and tourism		
None or other	5	18.52 %
Fisheries	15	55.56 %
Fishing and tourism	5	18.52 %
Tourism	2	7.41 %
(No answer)	2	
Only involved in fishing		
None or other	2	3.33 %
Fisheries	1	16.67 %
Fishing and tourism	1	16.67 %
Tourism	2	33.33 %
(No answer)	2	

Table A.9. The industry that respondents viewed as more harmful to the environment compared with major source of income

This activity causes more harm to the environment.	*n*	%
Main income from tourism		
None or other	5	33.33 %
Fisheries	4	26.67 %
Fishing and tourism	5	33.33 %
Tourism	1	6.67 %
(No answer)	8	
Main income from other industries		
None or other	1	14.29 %
Fisheries	4	57.14 %
Fishing and tourism	1	14.29 %
Tourism	1	14.29 %
(No answer)	1	
Main income from fisheries		
None or other	4	23.53 %
Fisheries	7	41.18 %
Fishing and tourism	3	17.65 %
Tourism	3	17.65 %
(No answer)	2	
Main income unknown		
None or other	3	
Fisheries	1	
Fishing and tourism	0	
Tourism	0	
(No answer)	1	

VITA

Maria Dominika Ivana Suradja graduated with a Bachelor of Science degree in Environmental Science from the Hong Kong University of Science and Technology. During her undergraduate years, she participated in research and conservation projects, including studying the impacts of ocean acidification on marine calcifying organisms as well as leadership and coordination in long-finned pilot whales. After graduating and before pursuing a Master of Marine Affairs at the University of Washington, she worked for several conservation non-governmental organizations in her home country of Indonesia, focusing on awareness raising and fundraising.